EPA Office of Compliance Sector Notebook Project:

Sector Notebook Data Refresh - 1997
Most current data available through 8/97

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Office of Compliance
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
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Washington, DC 20460

This report is an auxiliary part of the Sector Notebook Series, which is being published by the U.S. Environmental Protection Agency (EPA). The Notebook Series provides information of general interest regarding environmental issues associated with specific industrial sectors. The documents were developed under contract by Abt Associates (Cambridge, MA), Science Applications International Corporation (McLean, VA), and Booz-Allen & Hamilton, Inc. (McLean, VA). This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office. A listing of available Sector Notebooks and document numbers is included on the following page. For the most up to date list and contact person visit the notebook website mentioned below.

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Electronic versions of all Sector Notebooks are available via Internet on the Enviroene World Wide Web at **http://www.epa.gov/oeca/sector/index.html**.   Enviro$ense is a free, public, environmental exchange system operated by EPA's Office of Enforcement and Compliance Assurance and Office of Research and Development. The Network allows regulators, the regulated community, technical experts, and the general public to share information regarding: pollution prevention and innovative technologies; environmental enforcement and compliance assistance; laws, executive orders, regulations, and policies; points of contact for services and equipment; and other related topics. The Network welcomes receipt of environmental messages, information, and data from any public or private person or organization. To access this Notebook through the Web, set your web browser to the aforementioned web address, and select the desired Notebook; or point and click your way there as follows:

1)   set your browser to our primary web address: **http://www.epa.gov/oeca**;
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Sector Notebook Contacts

The Sector Notebooks were developed by the EPA's Office of Compliance. Questions relating to the Sector Notebook Project can be directed to:

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401 M St., SW (2223-A)
Washington, DC 20460
(202) 564-7017

Questions and comments regarding the individual documents can be directed to the appropriate specialists listed below. However, contacts are subject to change. If difficulties arise in contacting the specialist listed below, please consult the web site for the updated list.

Publication Number	Industry	Contact	Phone (202)
EPA/310-R-95-001.	Dry Cleaning Industry	Joyce Chandler	564-7073
EPA/310-R-95-002.	Electronics and Computer Industry*	Steve Hoover	564-7007
EPA/310-R-95-003.	Wood Furniture and Fixtures Industry	Bob Marshall	564-7021
EPA/310-R-95-004.	Inorganic Chemical Industry*	Walter DeRieux	564-7067
EPA/310-R-95-005.	Iron and Steel Industry	Maria Malave	564-7027
EPA/310-R-95-006.	Lumber and Wood Products Industry	Seth Heminway	564-7017
EPA/310-R-95-007.	Fabricated Metal Products Industry*	Scott Throwe	564-7013
EPA/310-R-95-008.	Metal Mining Industry	Jane Engert	564-5021
EPA/310-R-95-009.	Motor Vehicle Assembly Industry	Anthony Raia	564-6045
EPA/310-R-95-010.	Nonferrous Metals Industry	Jane Engert	564-5021
EPA/310-R-95-011.	Non-Fuel, Non-Metal Mining Industry	Rob Lischinsky	564-6045
EPA/310-R-95-012.	Organic Chemical Industry*	Walter DeRieux	564-7067
EPA/310-R-95-013.	Petroleum Refining Industry	Tom Ripp	564-7003
EPA/310-R-95-014.	Printing Industry	Ginger Gotliffe	564-7072
EPA/310-R-95-015.	Pulp and Paper Industry	Seth Heminway	564-7017
EPA/310-R-95-016.	Rubber and Plastic Industry	Maria Malave	564-7027
EPA/310-R-95-017.	Stone, Clay, Glass, and Concrete Industry	Scott Throwe	564-7013
EPA/310-R-95-018.	Transportation Equipment Cleaning Ind.	Virginia Lathrop	564-7057
EPA/310-R-97-001.	**Air Transportation Industry**	Virginia Lathrop	564-7057
EPA/310-R-97-002.	**Ground Transportation Industry**	Virginia Lathrop	564-7057
EPA/310-R-97-003.	**Water Transportation Industry**	Virginia Lathrop	564-7057
EPA/310-R-97-004.	**Metal Casting Industry**	Jane Engert	564-5021
EPA/310-R-97-005.	**Pharmaceuticals Industry**	Emily Chow	564-7071
EPA/310-R-97-006.	**Plastic Resin and Man-made Fiber Ind.**	Sally Sasnett	564-7074
EPA/310-R-97-007.	**Fossil Fuel Electric Power Generation**	Rafael Sanchez	564-7028
EPA/310-R-97-008.	**Shipbuilding and Repair Industry**	Anthony Raia	564-6045
EPA/310-R-97-009.	**Textile Industry**	Belinda Breidenbach	564-7022
EPA/310-R-97-010.	**Sector Notebook Data Refresh-1997**	Seth Heminway	564-7017

*Spanish translation available on the web.
Bolded titles were newly published in 1997. All other titles were published in 1995.

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LIST OF ACRONYMS

AFS -   AIRS Facility Subsystem (CAA database)
AIRS -   Aerometric Information Retrieval System (CAA database)
CAA -   Clean Air Act
CERCLA -   Comprehensive Environmental Response, Compensation and Liability Act
               (Superfund)
CERCLIS -   CERCLA Information System
CFCs -   Chlorofluorocarbons
CO -   Carbon Monoxide
CWA -   Clean Water Act
D&B -   Dun and Bradstreet Marketing Index
EPA -   United States Environmental Protection Agency
EPCRA -   Emergency Planning and Community Right-to-Know Act
FIFRA -   Federal Insecticide, Fungicide, and Rodenticide Act
FINDS -   Facility Indexing System
HAPs -   Hazardous Air Pollutants (CAA)
HSDB -   Hazardous Substances Data Bank
IDEA -   Integrated Data for Enforcement Analysis
NAAQS -   National Ambient Air Quality Standards (CAA)
NCDB -   National Compliance Database (for TSCA, FIFRA, EPCRA)
NESHAP -   National Emission Standards for Hazardous Air Pollutants
NOV -   Notice of Violation
NO_X -   Nitrogen Oxide
NPDES -   National Pollution Discharge Elimination System (CWA)
NPL -   National Priorities List (CERCLA)
NSPS -   New Source Performance Standards (CAA)
OAR -   Office of Air and Radiation
OECA -   Office of Enforcement and Compliance Assurance
OPA -   Oil Pollution Act
OPPTS -   Office of Prevention, Pesticides, and Toxic Substances
OSHA -   Occupational Safety and Health Administration
OSW -   Office of Solid Waste
OSWER -   Office of Solid Waste and Emergency Response
OW -   Office of Water
P2 -   Pollution Prevention
PCS -   Permit Compliance System (CWA Database)
POTW -   Publicly Owned Treatments Works
PPA -   Pollution Prevention Act
RCRA -   Resource Conservation and Recovery Act
RCRIS -   RCRA Information System
SARA -   Superfund Amendments and Reauthorization Act
SDWA -   Safe Drinking Water Act
SEPs -   Supplemental Environmental Projects

SIC -   Standard Industrial Classification
SO_X -   Sulfur Oxides
TRI -   Toxics Release Inventory
TRIS -   Toxics Release Inventory System
TCRIS -   Toxic Chemical Release Inventory System
TSCA -   Toxic Substances Control Act
UIC -   Underground Injection Control (SDWA)
UST -   Underground Storage Tanks (RCRA)
VOCs -   Volatile Organic Compounds

SECTOR NOTEBOOK DATA REFRESH - 1997

I. INTRODUCTION TO THE SECTOR NOTEBOOK PROJECT

Environmental policies based upon comprehensive analysis of air, water and land pollution (such as economic sector, and community-based approaches) are becoming an important supplement to traditional single-media approaches to environmental protection. Environmental regulatory agencies are beginning to embrace comprehensive, multi-statute solutions to facility permitting, compliance assurance, education/outreach, research, and regulatory development issues. The central concepts driving the new policy direction are that pollutant releases to each environmental medium (air, water and land) affect each other, and that environmental strategies must actively identify and address these interrelationships by designing policies for the "whole" facility. One way to achieve a whole facility focus is to design environmental policies for similar industrial facilities. By doing so, environmental concerns that are common to the manufacturing of similar products can be addressed in a comprehensive manner. Recognition of the need to develop the industrial "sector-based" approach within the EPA Office of Compliance led to the creation of the Sector Notebook Series.

The Sector Notebook Project was initiated by the Office of Compliance within the Office of Enforcement and Compliance Assurance (OECA) to provide its staff and managers with summary information on specific industrial sectors. As other EPA offices, states, the regulated community, environmental groups, and the public became interested in this project, the scope of the original project was expanded. The ability to design comprehensive, common sense environmental protection measures for specific industries is dependent on knowledge of several interrelated topics. For the purposes of this project, the key elements chosen for inclusion are: general industry information (economic and geographic); a description of industrial processes; pollution outputs; pollution prevention opportunities; Federal statutory and regulatory framework; compliance history; and a description of partnerships that have been formed between regulatory agencies, the regulated community and the public.

Industry sectors profiled in the Sector Notebook Project are defined in terms of the Standard Industrial Classification (SIC) System codes (as revised in 1987) which were established by the Office of Management and Budget (OMB) to track the flow of goods and services within the economy. SIC codes associated with each of the sectors included in this document can be found in the key at the bottom of page 5. More detailed descriptions of the scope of each industry sector can be found in Section II.A. of each Sector Notebook. OMB is in the process of changing the SIC code system to a system based on similar production processes called the North American

Industrial Classification System (NAICS). The 1987 SIC codes and the new NAICS codes can be accessed and cross-referenced at www.census.gov/naics.

Purpose of the Data Refresh

The first set of 18 Sector Notebooks were published in 1995. Within a year over 45,000 copies were distributed and significant interest was expressed for notebooks covering additional industry sectors. To meet this demand, a second set of Sector Notebooks was published in 1997 profiling additional industry sectors. More sector notebooks are also under development and will be available by early 1999. Check the Notebook website for the most up to date material (see p.ii for web address).

Much of the Toxic Release Inventory (TRI) and compliance and enforcement data presented in the first set of Sector Notebooks is two years older than that presented in the second set of documents published in 1997. Due to constantly changing economic, technological, and regulatory factors, pollutant release and compliance and enforcement data for an industry sector can change significantly from year-to-year. This refresh document was primarily developed to update the time sensitive data presented in the original set of Sector Notebooks.

In addition, the TRI and compliance and enforcement data included with the Sector Notebooks published in 1997 are presented in this document. A particular strength of the Sector Notebooks has been the consistent organization and presentation of data in each document, allowing comparisons between industry sectors based on the same criteria. Therefore, the data presented in this document cover both the original set of 17 sectors[1] and the second set of nine sectors published in 1997. The same methods were used to collect the data for all sectors presented here.

Readers of the Sector Notebook Series may also be interested in EPA's Sector Facility Indexing Project (SFIP) which is available through EPA's website at www.epa.gov/oeca/sfi. The SFIP is a compilation of individual facility environmental release and compliance data for five key industries: iron and steel, primary non-ferrous metals, petroleum refining, pulp manufacturing, automobile assembly. Although similar types of data may be presented, the SFIP and the Sector Notebook Project are separate projects. Much of the data collected for this Data Refresh were collected prior to the completion of SFIP. Some data definitions and collection methods presented in SFIP may not be reflected in this document.

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[1] One Sector Notebook published in 1995, *Profile of the Transportation Equipment Cleaning Industry*, did not contain pollutant release and compliance and enforcement data. Therefore, this sector is not included in this document.

Providing Comments

If you have any comments on the existing notebooks, or if you would like to provide additional information, please send a hard copy and computer disk to the EPA Office of Compliance, Sector Notebook Project, 401 M St., SW (2223-A), Washington, DC 20460. Comments can also be sent via the web page or to notebook@epamail.epa.gov.

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II. CROSS-SECTOR COMPARISONS

This section contains TRI, AIRS, and IDEA data presentations comparing the sectors covered by the Sector Notebook Project[2]. The graph and tables update those presented in the original set of 17 Sector Notebooks with the most recent available data and the additional industry sectors covered in the Sector Notebooks published in 1997.

II.A. Toxics Release Inventory (TRI)

The following information is presented as a comparison of pollutant release and transfer data across industrial categories. It is provided to give a general sense of the relative scale of TRI releases and transfers within each sector required to report to TRI and profiled under this project. Please note that the following figures and table do not contain releases and transfers for industrial categories that are not included in this project, and thus cannot be used to draw conclusions regarding the total release and transfer amounts that are reported to TRI. Similar information is available within the annual TRI Public Data Release Book. (See directions for obtaining this on page 20.)

Figure 1 is a graphical representation of a summary of the 1995 TRI data for sectors profiled by the Sector Notebook Project and which were required to report to TRI in the 1995 reporting year. The bar graph presents the total TRI releases and total transfers on the vertical axis. Figure 2 presents the relative percentage of total TRI chemicals (releaseses and transfers) contributed by each of these sectors. The graphs are based on the data shown in Table 1 and are meant to facilitate comparisons between the relative amounts of releases, transfers, and releases per facility both within and between these sectors. The reader should note that differences in the proportion of facilities captured by TRI exist between industry sectors. This can be a factor of poor SIC code matching and relative differences in the number of facilities reporting to TRI from the various sectors. Within some sectors, the majority of facilities are not subject to TRI reporting because they are not considered manufacturing facilities, they have fewer than 10 employees, or because they are below TRI reporting thresholds. For example, many facilities in the printing industry have fewer than 10 employees and therefore are not required to report to TRI. The 1995 TRI data for the printing industry presented in this document is based on reports from 262 facilities, yet the printing industry universe has been put at approximately 70,000 facilities by industry sources; the TRI data covers less than one percent of the industry. As a result, a significant portion of printing industry chemical releases and transfers are not captured by TRI.

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[2] TRI data is only presented for those industry sectors covered by the Sector Notebook Project and which were required to report to TRI in the 1995 reporting year.

Figure 1: Summary of TRI Releases and Transfers by Industry
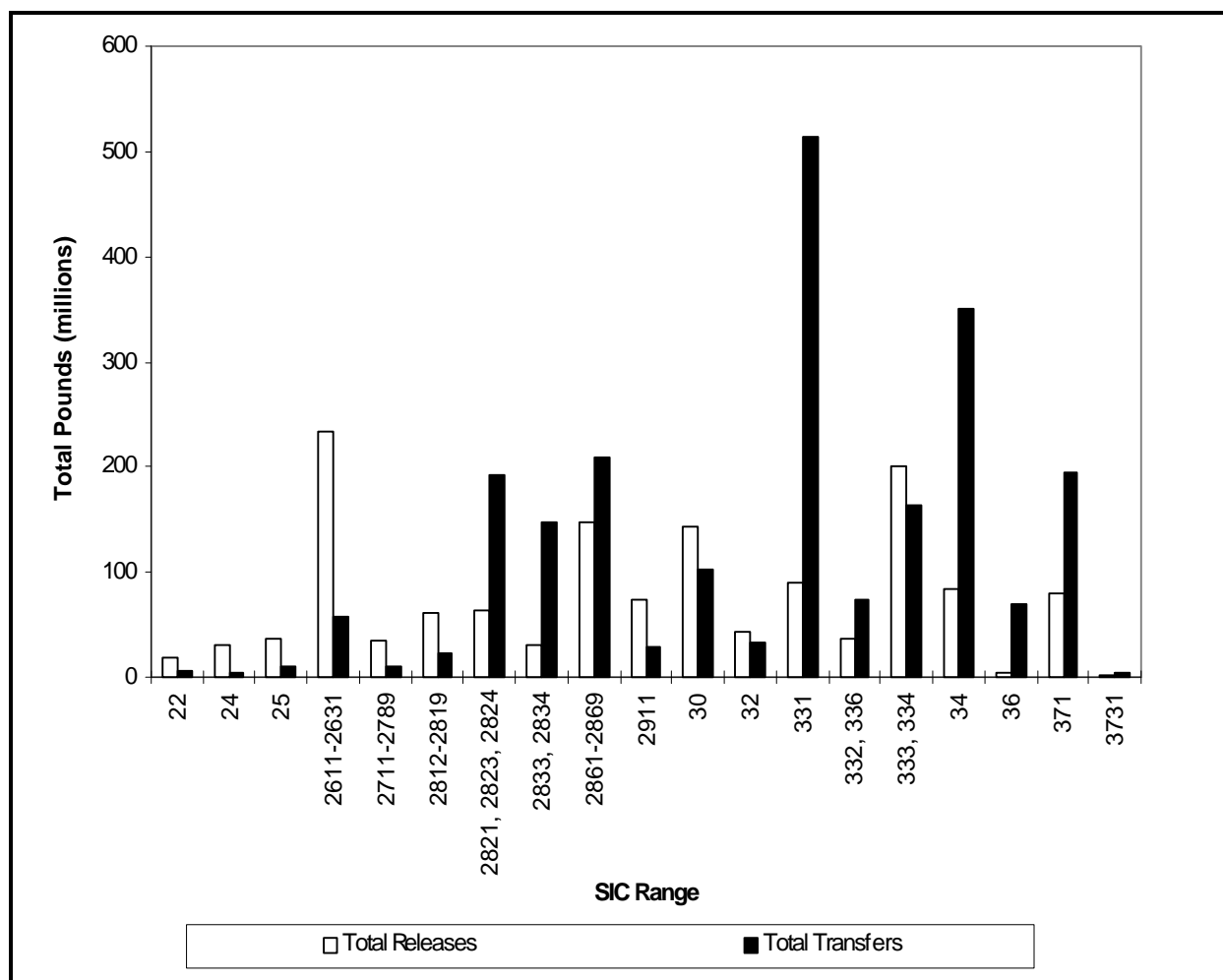
Source: USEPA 1995 Toxics Release Inventory Database.

Key to Standard Industrial Classification (SIC) Codes

SIC Range	Industry Sector	SIC Range	Industry Sector	SIC Range	Industry Sector
22	Textiles	2833, 2834	Pharmaceuticals	332, 336	Metal Casting
24	Lumber and Wood Products	2861-2869	Organic Chem. Mfg.	333, 334	Nonferrous Metals
25	Furniture and Fixtures	2911	Petroleum Refining	34	Fabricated Metals
2611-2631	Pulp and Paper	30	Rubber and Misc. Plastics	36	Electronic Equip. and Comp.
2711-2789	Printing	32	Stone, Clay, and Concrete	371	Motor Vehicles, Bodies, Parts, and Accessories
2812-2819	Inorganic Chemical Manufacturing	331	Iron and Steel	3731	Shipbuilding and Repair
2821, 2823, 2824	Plastic Resins and Man-made Fibers				

Figure 2: 1995 TRI Total Releases and Transfers by Industry Sector
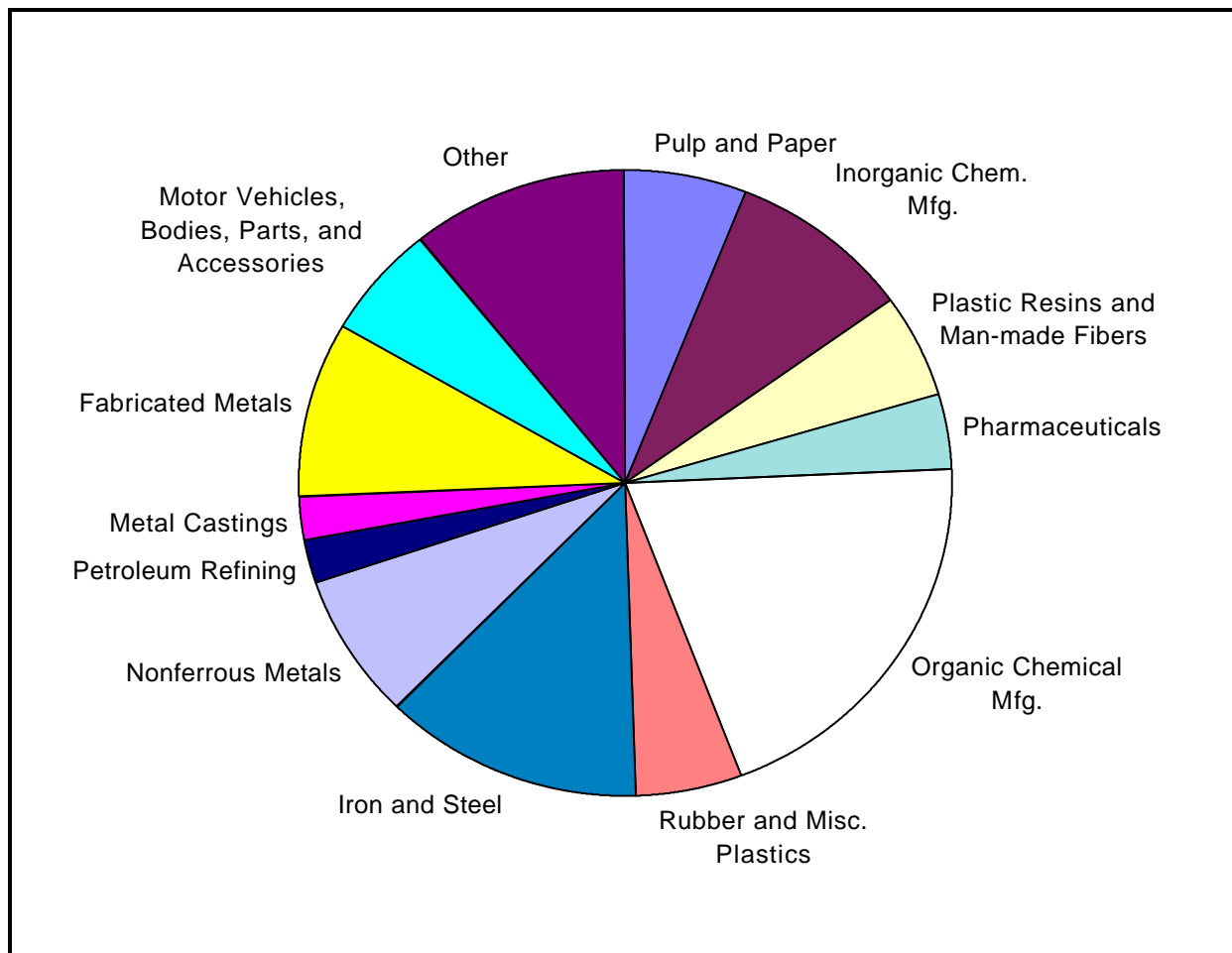
Source: USEPA 1995 Toxics Release Inventory Database.

Other (Industries with releases less than 100 million pounds):

Textiles	Stone, Clay, and Concrete
Lumber and Wood Products	Electronic Equipment and Computers
Furniture and Fixtures	Shipbuilding and Repair
Printing	

Table 1: Toxics Release Inventory Data for Selected Industries

Industry Sector	SIC Range	# TRI Facilities	TRI Releases		TRI Transfers		Total Releases +Transfers (million lbs.)	Average Releases + Transfers per Facility (pounds)
			Total Releases (million lbs.)	Ave. Releases per Facility (pounds)	Total Transfers (million lbs.)	Ave. Trans. per Facility (pounds)		
Textiles	22	339	17.8	53,000	7.0	21,000	24.8	74,000
Lumber and Wood Products	24	397	30.0	76,000	4.1	10,000	34.1	86,000
Furniture and Fixtures	25	336	37.6	112,000	9.9	29,000	47.5	141,000
Pulp and Paper	2611-2631	305	232.6	763,000	56.5	185,000	289.1	948,000
Printing	2711-2789	262	33.9	129,000	10.4	40,000	44.3	169,000
Inorganic Chem. Mfg.	2812-2819	413	60.7	468,000	21.7	191,000	438.5	659,000
Plastic Resins and Man-made Fibers	2821,2823, 2824	410	64.1	156,000	192.4	469,000	256.5	625,000
Pharmaceuticals	2833, 2834	200	29.9	150,000	147.2	736,000	177.1	886,000
Organic Chemical Mfg.	2861-2869	402	148.3	598,000	208.6	631,000	946.8	1,229,000
Petroleum Refining	2911	180	73.8	410,000	29.2	162,000	103.0	572,000
Rubber and Misc. Plastics	30	1,947	143.1	73,000	102.6	53,000	245.7	126,000
Stone, Clay, and Concrete	32	623	43.9	70,000	31.8	51,000	75.7	121,000
Iron and Steel	331	423	90.7	214,000	513.9	1,215,000	604.6	1,429,000
Metal Casting	332,336	654	36.0	55,000	73.9	113,000	109.9	168,000
Nonferrous Metals	333, 334	282	201.7	715,000	164	582,000	365.7	1,297,000
Fabricated Metals	34	2,676	83.5	31,000	350.5	131,000	434.0	162,000
Electronic Equip. and Comp.	36	407	4.3	11,000	68.8	169,000	73.1	180,000
Motor Vehicles, Bodies, Parts, and Accessories	371	754	79.3	105,000	194	257,000	273.3	362,000
Shipbuilding	3731	43	2.4	56,000	4.1	95,000	6.5	151,000
Sector Notebook Total	NA	11,053	1,413.6	128,000	2,190.6	198,000	4,550.2	412,000
1995 TRI Total	NA	21,951	2,208.7	101,000	3,534.8	161,000	5,743.5	262,000

Source: *US EPA Toxics Release Inventory Database, 1995.*

II.B. Aerometric Information Retrieval System (AIRS)

The toxic chemical release data obtained from TRI allows comparisons across years and industry sectors. However, reported chemicals are limited to the approximately 600 TRI chemicals. A large portion of the emissions from manufacturing facilities, therefore, are not captured by TRI. The EPA Office of Air Quality Planning and Standards has compiled air pollutant emission factors for determining the total air emissions of priority pollutants (e.g., VOCs, SOx, NOx, CO, particulates, etc.) from many sources. However, AIRS data, like TRI data, are affected by threshold quantities that limit the number of sources captured. The pollutant contribution from minor sources is not captured.

AIRS contains a wide range of information related to stationary sources of air pollution, including the emissions of a number of air pollutants which may be of concern within a particular industry. With the exception of volatile organic compounds (VOCs), there is little overlap with the TRI chemicals reported above. Table 2 summarizes annual releases (from the industries for which a Sector Profile was prepared) of carbon monoxide (CO), nitrogen dioxide (NO$_2$), total particulate matter (PT), particulate matter of 10 microns or less, a subset of PT, (PM10), sulfur dioxide (SO$_2$), and volatile organic compounds (VOCs).

Figure 3 is a graphical representation of a summary of AIRS data for selected sectors profiled by the Sector Notebook Project. AIRS data are collected only for stationary sources; thus, the emissions reported by the Air Transportation, Water Transportation, and Ground Transportation industries are limited to the facilities supporting those industries and do not include emissions from their respective mobile sources. The bar graph presents the releases of five pollutants (not including PM10) on the vertical axis. The graph is based on the data shown in Table 2 and is meant to facilitate comparisons between the relative amounts of releases of the pollutants both within and between these sectors.

Figure 3: Summary of AIRS Releases by Industry*
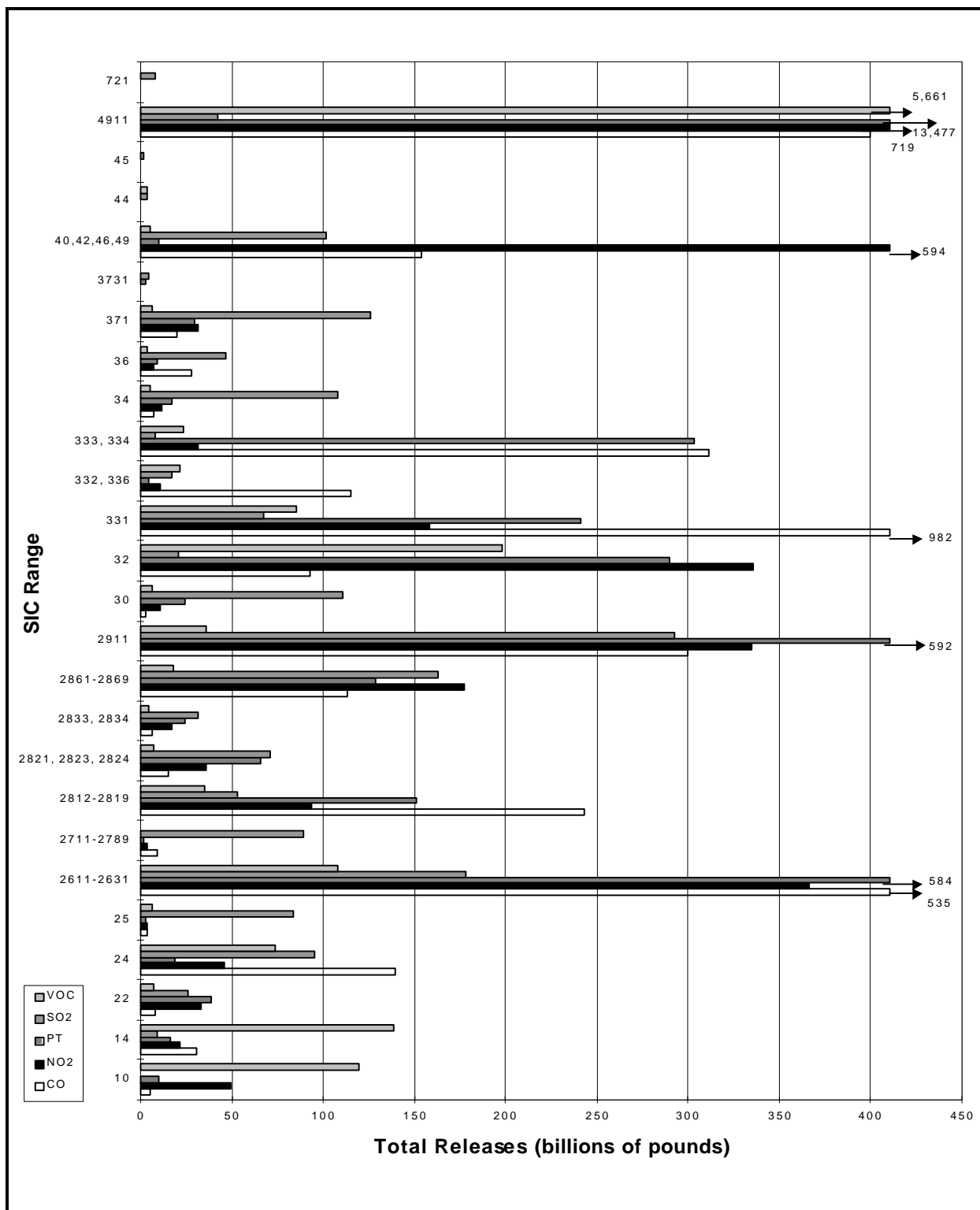
*Arrows indicate values which overshadow the majority of industry releases. Actual release quantities (in billions of pounds) for each shortened bar are adjacent to their corresponding arrows. Thus, the bars with arrows are not to scale.

Key to Standard Industrial Classification (SIC) Codes

SIC Range	Industry Sector	SIC Range	Industry Sector	SIC Range	Industry Sector
10	Metal Mining	2833, 2834	Pharmaceuticals	34	Fabricated Metals
14	Non-Fuel, Non-Metal Mining	2861-2869	Organic Chem. Mfg.	36	Electronic Equip. and Comp.
22	Textiles	2911	Petroleum Refining	371	Motor Vehicles, Bodies, Parts, and Accessories
24	Lumber and Wood Products	30	Rubber and Misc. Plastics	3731	Shipbuilding and Repair
25	Furniture and Fixtures	32	Stone, Clay, and Concrete	40,42,46,49	Ground Transportation
2611-2631	Pulp and Paper	331	Iron and Steel	44	Water Transportation
2711-2789	Printing	332, 336	Metal Casting	45	Air Transportation
2812-2819	Inorganic Chemical Manufacturing	333, 334	Nonferrous Metals	721	Dry Cleaning
2821, 2823, 2824	Plastic Resins and Manmade Fibers				

Table 2: Air Pollutant Releases by Industry Sector (tons/year)						
Industry Sector	CO	NO$_2$	PM10	PT	SO$_2$	VOC
Metal Mining	4,951	49,252	21,732	9,478	1,202	119,761
Non-Fuel, Non-Metal Mining	31,008	21,660	44,305	16,433	9,183	138,684
Textiles	8,164	33,053	1,819	38,505	26,326	7,113
Lumber and Wood Products	139,175	45,533	30,818	18,461	95,228	74,028
Wood Furniture and Fixtures	3,659	3,267	2,950	3,042	84,036	5,895
Pulp and Paper	584,817	365,901	37,869	535,712	177,937	107,676
Printing	8,847	3,629	539	1,772	88,788	1,291
Inorganic Chemicals	242,834	93,763	6,984	150,971	52,973	34,885
Plastic Resins and Man-made Fibers	15,022	36,424	2,027	65,875	71,416	7,580
Pharmaceuticals	6,389	17,091	1,623	24,506	31,645	4,733
Organic Chemicals	112,999	177,094	13,245	129,144	162,488	17,765
Petroleum Refining	299,546	334,795	25,271	592,117	292,167	36,421
Rubber and Plastic	2,463	10,977	3,391	24,366	110,739	6,302
Stone, Clay, Glass and Concrete	92,463	335,290	58,398	290,017	21,092	198,404
Iron and Steel	982,410	158,020	36,973	241,436	67,682	85,608
Metal Castings	115,269	10,435	14,667	4,881	17,301	21,554
Nonferrous Metals	311,733	31,121	12,545	303,599	7,882	23,811
Fabricated Metal Products	7,135	11,729	2,811	17,535	108,228	5,043
Electronics and Computers	27,702	7,223	1,230	8,568	46,444	3,464
Motor Vehicle Assembly	19,700	31,127	3,900	29,766	125,755	6,212
Shipbuilding and Repair	109	866	762	2,862	4,345	707
Ground Transportation	153,631	594,672	2,338	9,555	101,775	5,542
Water Transportation	179	476	676	712	3,514	3,775
Air Transportation	1,244	960	133	147	1,815	144
Fossil Fuel Electric Power	399,585	5,661,468	221,787	13,477,367	42,726	719,644
Dry Cleaning	145	781	10	725	7,920	40
Source: U.S. EPA Office of Air and Radiation, AIRS Database, 1997.						

II.C. Integrated Data for Enforcement Analysis (IDEA) System

Until recently, EPA has focused much of its attention on measuring compliance with specific environmental statutes. This approach allows the Agency to track compliance with the Clean Air Act (CAA), the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), and other environmental statutes. Within the last several years, the Agency has begun to supplement single-statute compliance indicators with facility-specific, multimedia indicators of compliance. In doing so, EPA is in a better position to track compliance with all statutes at the facility level, and within specific industrial sectors.

A major step in building the capacity to compile multimedia/multistatute data for industrial sectors was the creation of EPA's Integrated Data for Enforcement Analysis (IDEA) system. IDEA has the capacity to "read into" the Agency's single-statute databases, extract compliance records, and match the records to individual facilities. The IDEA system can match Air, Water, Waste, Toxics/Pesticides/EPCRA, TRI, and Enforcement Docket records for a given facility, and generate a list of historical permit, inspection, and enforcement activity.   IDEA also has the capability to analyze data by geographic area and corporate entity. As the capacity to generate multimedia compliance data improves, EPA will make available more in-depth compliance and enforcement information.

Compliance and Enforcement Profile Description

Using inspection, violation and enforcement data from the IDEA system, this section provides information regarding the historical compliance and enforcement activity of sectors. For each of these sectors, the IDEA system was used to obtain facility compliance and enforcement data from the various single-media databases. The data obtained covers facilities that are regulated under one or more of the following environmental statutes: CWA, CAA, RCRA, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Toxic Substances Control Act (TSCA), and Emergency Planning and Community Right-to-Know Act (EPCRA). There are a number of other federal statutory requirements that are not included in the sector notebook project compliance and enforcement profiles. These include, for example, requirements under Superfund and the Safe Drinking Water Act. The analysis in this report summarizes inspection and enforcement actions, retrospectively, and reflects only those EPA, State, and local activities that have been entered into EPA's databases.

Within the IDEA system, one can design compliance history queries to obtain facility-level data for specific industry sectors, environmental statutes, geographic regions, time periods, or other characteristics. The "facility

universe" obtained from an IDEA search depends on how the selection criteria are specified. Each program office database retains sector-identifying SIC information that are often reported inconsistently by facilities. Therefore, depending on the search criteria specified, many different universes of facilities are possible, even within a single industry sector.

In the search criteria used in this section, a facility must have a TRI reporting number and must report only SIC codes within that industry sector's defined range. This selection criteria allows the compliance and enforcement data and chemical release data to be compiled using a consistent method. The selection criteria in this document are consistent across sectors with a few exceptions. For sectors that were not required to file 1995 TRI reports (e.g., Non-Fuel, Non-Metal Mining; Metal Mining) and those that do not normally report to the TRI program because of size (Printing and Dry Cleaning), data have been provided from all facilities in EPA's Facility Indexing System (FINDS) that fall within the defined sector SIC code range. FINDS assigns a common facility number to EPA single-statute permit records. Please note, in this document, EPA does not attempt to define the precise number of facilities that fall within each sector. Rather, this section portrays the records of the facilities within the sector that are included in the EPA databases, which is the most accurate data available. For data that includes a more precise count of facilities in an individual sector see the Sector Facility Indexing Project, which is described on page 2.

Following this discussion is a list of definitions for each data column of the tables presented at the end of this section. The values in the tables summarize inspections and enforcement actions for each sector, and reflect solely EPA, State, and local compliance assurance activities that have been entered into EPA databases. To identify any changes in trends, this section shows the results of data queries for two different time periods, one for the past five calendar years (April 1, 1992 to March 31, 1997) and the other for the most recent twelve-month period (April 1, 1996 to March 31, 1997). The five-year analysis gives an average level of activity for that period for comparison to the more recent compliance and enforcement activity.

Because most inspections focus on single-media requirements, the data queries presented in this section are taken from single media databases. This document does not provide data on whether inspections are state/local or EPA-led. However, the table breaking down the universe of violations does give the reader a crude measurement of the EPA's and states' efforts within each media program. The data presented in the industry-specific tables

illustrate the variations across EPA Regions for certain sectors.[3]   This variation may be attributable to state/local data entry variations, specific geographic concentrations, proximity to population centers, sensitive ecosystems, highly toxic chemicals used in production, or historical noncompliance. Hence, the exhibited data do not rank regional performance or necessarily reflect which regions may have the most compliance problems.

Compliance and Enforcement Data Definitions

General Definitions

Facility Indexing System (FINDS) -- assigns a common facility number to EPA single-media permit records. The FINDS identification number allows EPA to compile and review all permit, compliance, enforcement and pollutant release data for any given regulated facility.

Integrated Data for Enforcement Analysis (IDEA) -- is a data integration system that can retrieve information from the major EPA program office databases. IDEA uses the FINDS identification number to link separate data records from EPA's databases.   This allows retrieval of records from across media or statutes for any given facility, thus creating a "master list" of records for that facility. Some of the data systems accessible through IDEA are: AFS (AIRS Facility Subsystem, Office of Air and Radiation), PCS (Permit Compliance System, Office of Water), RCRIS (Resource Conservation and Recovery Information System, Office of Solid Waste), NCDB (National Compliance Data Base, Office of Prevention, Pesticides, and Toxic Substances), CERCLIS (Comprehensive Environmental and Liability Information System, Superfund), and TRIS (Toxic Release Inventory System). IDEA also contains information from outside sources such as Dun and Bradstreet and the Occupational Safety and Health Administration (OSHA). Most data queries displayed in notebook sections IV, Chemical Releases and Transfers, and VII, Compliance and Enforcement History, were conducted using IDEA.

Data Table Column Heading Definitions

Facilities in Search -- are based on the universe of TRI reporters within the listed SIC code range. For industries not covered under TRI reporting requirements (metal mining; non-fuel; non-metal mining; electric power generation; ground transportation; water transportation; and dry cleaning), or

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[3] EPA Regions include the following states: I (CT, MA, ME, RI, NH, VT); II (NJ, NY, PR, VI); III (DC, DE, MD, PA, VA, WV); IV (AL, FL, GA, KY, MS, NC, SC, TN); V (IL, IN, MI, MN, OH, WI); VI (AR, LA, NM, OK, TX); VII (IA, KS, MO, NE); VIII (CO, MT, ND, SD, UT, WY); IX (AZ, CA, HI, NV, Pacific Trust Territories); X (AK, ID, OR, WA).

industries in which only a very small fraction of facilities report to TRI (e.g., printing), the notebook uses the FINDS universe for executing data queries. The SIC code range selected for each search is defined by each notebook's selected SIC code coverage.

Facilities Inspected -- indicates the level of EPA and state agency inspections for the facilities in this data search. These values show what percentage of the facility universe is inspected in a one-year or five-year period.

Number of Inspections -- measures the total number of inspections conducted in this sector. An inspection event is counted each time it is entered into a single media database.

Average Time Between Inspections -- provides an average length of time, expressed in months, between compliance inspections at a facility within the defined universe.

Facilities with One or More Enforcement Actions -- expresses the number of facilities that were the subject of at least one enforcement action within the defined time period. This category is broken down further into federal and state actions. Data are obtained for administrative, civil/judicial, and criminal enforcement actions. Readers should note that, historically, criminal enforcement actions have not been fully reflected in the EPA databases. A facility with multiple enforcement actions is only counted once in this column, e.g., a facility with 3 enforcement actions counts as 1 facility.

Total Closed Enforcement Actions -- describes the total number of enforcement actions identified for an industrial sector across all environmental statutes. A facility with multiple enforcement actions is counted multiple times, e.g., a facility with 3 enforcement actions counts as 3.

State Lead Actions -- shows what percentage of the total enforcement actions are taken by state and local environmental agencies. Varying levels of use by states of EPA data systems may limit the volume of actions recorded as state enforcement activity. Some states extensively report enforcement activities into EPA data systems, while other states may use their own data systems.

Federal Lead Actions -- shows what percentage of the total enforcement actions are taken by the United States Environmental Protection Agency. This value includes referrals from state agencies. Many of these actions result from coordinated or joint state/federal efforts.

Enforcement to Inspection Rate -- is a ratio of enforcement actions to inspections, and is presented for comparative purposes only. This ratio is a

rough indicator of the relationship between inspections and enforcement. It relates the number of enforcement actions and the number of inspections that occurred within the one-year or five-year period. This ratio includes the inspections and enforcement actions reported under the CWA, CAA and RCRA. Inspections and actions from the TSCA/FIFRA/ EPCRA database are not factored into this ratio because most of the actions taken under these programs are not the result of facility inspections. Also, this ratio does not account for enforcement actions arising from non-inspection compliance monitoring activities (e.g., self-reported water discharges) that can result in enforcement action within the CAA, CWA, and RCRA.

Facilities with One or More Violations Identified -- indicates the percentage of inspected facilities having a violation identified in one of the following data categories: In Violation or Significant Violation Status (CAA); Reportable Noncompliance, Current Year Noncompliance, Significant Noncompliance (CWA); Noncompliance and Significant Noncompliance (FIFRA, TSCA, and EPCRA); Unresolved Violation and Unresolved High Priority Violation (RCRA). The values presented for this column reflect the extent of noncompliance within the measured time frame, but do not distinguish between the severity of the noncompliance. Violation status may be a precursor to an enforcement action, but does not necessarily indicate that an enforcement action will occur.

Media Breakdown of Enforcement Actions and Inspections -- four columns identify the proportion of total inspections and enforcement actions within EPA Air, Water, Waste, and FIFRA/TSCA/EPCRA databases. Each column is a percentage of either the "Total Inspections," or the "Total Actions" column.

Tables 3 and 4 allow comparisons between the compliance histories of the industries covered by the Sector Notebooks. Comparisons between Tables 3 and 4 permit the identification of trends in compliance and enforcement records of the various industries by comparing data covering the last five years (April 1992 to April 1997) to that of the past year (April 1996 to April 1997).

Tables 5 and 6 provide a more in-depth comparison between the sectors by breaking out the compliance and enforcement data by environmental statute. As in the previous Tables (Tables 3 and 4), the data cover the last five years (Table 5) and the last one year (Table 6) to facilitate the identification of recent trends.

Table 3: Five-Year Enforcement and Compliance Summary for Selected Industries

A	B	C	D	E	F	G	H	I	J
Industry Sector	Facilities in Search	Facilities Inspected	Number of Inspections	Average Months Between Inspections	Facilities with 1 or More Enforcement Actions	Total Closed Enforcement Actions	Percent State Lead Actions	Percent Federal Lead Actions	Enforcement to Inspection Rate
Metal Mining	1,232	378	1,600	46	63	111	53%	47%	0.07
Non-Fuel, Non-Metal Mining	5,256	2,803	12,826	25	385	622	77%	23%	0.05
Textiles	355	267	1,465	15	53	83	90%	10%	0.06
Lumber and Wood	712	473	2,767	15	134	265	70%	30%	0.10
Furniture	499	386	2,379	13	65	91	81%	19%	0.04
Pulp and Paper	484	430	4,630	6	150	478	80%	20%	0.10
Printing	5,862	2,092	7,691	46	238	428	88%	12%	0.06
Inorganic Chemicals	441	286	3,087	9	89	235	74%	26%	0.08
Resins and Manmade Fibers	329	263	2,430	8	93	219	76%	24%	0.09
Pharmaceuticals	164	129	1,201	8	35	122	80%	20%	0.10
Organic Chemicals	425	355	4,294	6	153	468	65%	35%	0.11
Petroleum Refining	156	148	3,081	3	124	763	68%	32%	0.25
Rubber and Plastic	1,818	981	4,383	25	178	276	82%	18%	0.06
Stone, Clay, Glass and Concrete	615	388	3,474	11	97	277	75%	25%	0.08
Iron and Steel	349	275	4,476	5	121	305	71%	29%	0.07
Metal Castings	669	424	2,535	16	113	191	71%	29%	0.08
Nonferrous Metals	203	161	1,640	7	68	174	78%	22%	0.11
Fabricated Metal Products	2,906	1,858	7,914	22	365	600	75%	25%	0.08
Electronics	1,250	863	4,500	17	150	251	80%	20%	0.06
Automobile Assembly	1,260	927	5,912	13	253	413	82%	18%	0.07
Shipbuilding and Repair	44	37	243	9	20	32	84%	16%	0.13
Ground Transportation	7,786	3,263	12,904	36	375	774	84%	16%	0.06
Water Transportation	514	192	816	38	36	70	61%	39%	0.09
Air Transportation	444	231	973	27	48	97	88%	12%	0.10
Fossil Fuel Electric Power	3,270	2,166	14,210	14	403	789	76%	24%	0.06
Dry Cleaning	6,063	2,360	3,813	95	55	66	95%	5%	0.02

Table 4: One-Year Enforcement and Compliance Summary for Selected Industries

A	B	C	D	E		F		G	H
Industry Sector	Facilities in Search	Facilities Inspected	Number of Inspections	Facilities with 1 or More Violations		Facilities with 1 or more Enforcement Actions		Total Closed Enforcement Actions	Enforcement to Inspection Rate
				Number	Percent*	Number	Percent*		
Metal Mining	1,232	142	211	102	72%	9	6%	10	0.05
Non-Fuel, Non-Metal Mining	5,256	1,481	2,451	384	26%	73	5%	91	0.04
Textiles	355	172	295	96	56%	10	6%	12	0.04
Lumber and Wood	712	279	507	192	69%	44	16%	52	0.10
Furniture	499	254	459	136	54%	9	4%	11	0.02
Pulp and Paper	484	317	788	248	78%	43	14%	74	0.09
Printing	5,862	892	1,363	577	65%	28	3%	53	0.04
Inorganic Chemicals	441	200	548	155	78%	19	10%	31	0.06
Resins and Manmade Fibers	329	173	419	152	88%	26	15%	36	0.09
Pharmaceuticals	164	80	209	84	105%	8	10%	14	0.07
Organic Chemicals	425	259	837	243	94%	42	16%	56	0.07
Petroleum Refining	156	132	565	129	98%	58	44%	132	0.23
Rubber and Plastic	1,818	466	791	389	83%	33	7%	41	0.05
Stone, Clay, Glass and Concrete	615	255	678	151	59%	19	7%	27	0.04
Iron and Steel	349	197	866	174	88%	22	11%	34	0.04
Metal Castings	669	234	433	240	103%	24	10%	26	0.06
Nonferrous Metals	203	108	310	98	91%	17	16%	28	0.09
Fabricated Metal	2,906	849	1,377	796	94%	63	7%	83	0.06
Electronics	1,250	420	780	402	96%	27	6%	43	0.06
Automobile Assembly	1,260	507	1,058	431	85%	35	7%	47	0.04
Shipbuilding and Repair	44	22	51	19	86%	3	14%	4	0.08
Ground Transportation	7,786	1,585	2,499	681	43%	85	5%	103	0.04
Water Transportation	514	84	141	53	63%	10	12%	11	0.08
Air Transportation	444	96	151	69	72%	8	8%	12	0.08
Fossil Fuel Electric Power	3,270	1,318	2,430	804	61%	100	8%	135	0.06
Dry Cleaning	6,063	1,234	1,436	314	25%	12	1%	16	0.01

*Percentages in Columns E and F are based on the number of facilities inspected (Column C). Percentages can exceed 100% because violations and actions can occur without a facility inspection.

Table 5: Five-Year Inspection and Enforcement Summary by Statute for Selected Industries

Industry Sector	Facilities Inspected	Total Inspections	Total Closed Enforcement Actions	Clean Air Act		Clean Water Act		RCRA		FIFRA/TSCA/ EPCRA/Other	
				% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions
Metal Mining	378	1,600	111	39%	19%	52%	52%	8%	12%	1%	17%
Non-Fuel, Non-Metal Mining	2,803	12,826	622	83%	81%	14%	13%	3%	4%	0%	3%
Textiles	267	1,465	83	58%	54%	22%	25%	18%	14%	2%	6%
Lumber and Wood	473	2,767	265	49%	47%	6%	6%	44%	31%	1%	16%
Furniture	386	2,379	91	62%	42%	3%	0%	34%	43%	1%	14%
Pulp and Paper	430	4,630	478	51%	59%	32%	28%	15%	10%	2%	4%
Printing	2,092	7,691	428	60%	64%	5%	3%	35%	29%	1%	4%
Inorganic Chemicals	286	3,087	235	38%	44%	27%	21%	34%	30%	1%	5%
Resins and Manmade Fibers	263	2,430	219	35%	43%	23%	28%	38%	23%	4%	6%
Pharmaceuticals	129	1,201	122	35%	49%	15%	25%	45%	20%	5%	5%
Organic Chemicals	355	4,294	468	37%	42%	16%	25%	44%	28%	4%	6%
Petroleum Refining	148	3,081	763	42%	59%	20%	13%	36%	21%	2%	7%
Rubber and Plastic	981	4,383	276	51%	44%	12%	11%	35%	34%	2%	11%
Stone, Clay, Glass and Concrete	388	3,474	277	56%	57%	13%	9%	31%	30%	1%	4%
Iron and Steel	275	4,476	305	45%	35%	26%	26%	28%	31%	1%	8%
Metal Castings	424	2,535	191	55%	44%	11%	10%	32%	31%	2%	14%
Nonferrous Metals	161	1,640	174	48%	43%	18%	17%	33%	31%	1%	10%
Fabricated Metal	1,858	7,914	600	40%	33%	12%	11%	45%	43%	2%	13%
Electronics	863	4,500	251	38%	32%	13%	11%	47%	50%	2%	7%
Automobile Assembly	927	5,912	413	47%	39%	8%	9%	43%	43%	2%	9%
Shipbuilding and Repair	37	243	32	39%	25%	14%	25%	42%	47%	5%	3%
Ground Transportation	3,263	12,904	774	59%	41%	12%	11%	29%	45%	1%	3%
Water Transportation	192	816	70	39%	29%	23%	34%	37%	33%	1%	4%
Air Transportation	231	973	97	25%	32%	27%	20%	48%	48%	0%	0%
Fossil Fuel Electric Power	2,166	14,210	789	57%	59%	32%	26%	11%	10%	1%	5%
Dry Cleaning	2,360	3,813	66	56%	23%	3%	6%	41%	71%	0%	0%

Table 6: One-Year Inspection and Enforcement Summary by Statute for Selected Industries

Industry Sector	Facilities Inspected	Total Inspections	Total Closed Enforcement Actions	Clean Air Act % of Total Inspections	Clean Air Act % of Total Actions	Clean Water Act % of Total Inspections	Clean Water Act % of Total Actions	RCRA % of Total Inspections	RCRA % of Total Actions	FIFRA/TSCA/EPCRA/Other % of Total Inspections	FIFRA/TSCA/EPCRA/Other % of Total Actions
Metal Mining	142	211	10	52%	0%	40%	40%	8%	30%	0%	30%
Non-Fuel, Non-Metal Mining	1,481	2,451	91	87%	89%	10%	9%	3%	2%	0%	0%
Textiles	172	295	12	66%	75%	17%	17%	17%	8%	0%	0%
Lumber and Wood	279	507	52	51%	30%	6%	5%	44%	25%	0%	40%
Furniture	254	459	11	66%	45%	2%	0%	32%	45%	0%	9%
Pulp and Paper	317	788	74	54%	73%	32%	19%	14%	7%	0%	1%
Printing	892	1,363	53	63%	77%	4%	0%	33%	23%	0%	0%
Inorganic Chemicals	200	548	31	35%	59%	26%	9%	39%	25%	0%	6%
Resins and Manmade Fibers	173	419	36	38%	51%	24%	38%	38%	5%	0%	5%
Pharmaceuticals	80	209	14	43%	71%	11%	14%	45%	14%	0%	0%
Organic Chemicals	259	837	56	40%	54%	13%	13%	47%	34%	0%	0%
Petroleum Refining	132	565	132	49%	67%	17%	8%	34%	15%	0%	10%
Rubber and Plastic	466	791	41	55%	64%	10%	13%	35%	23%	0%	0%
Stone, Clay, Glass and Concrete	255	678	27	62%	63%	10%	7%	28%	30%	0%	0%
Iron and Steel	197	866	34	52%	47%	23%	29%	26%	24%	0%	0%
Metal Castings	234	433	26	60%	58%	10%	8%	30%	35%	0%	0%
Nonferrous Metals	108	310	28	44%	43%	15%	20%	41%	30%	0%	7%
Fabricated Metal	849	1,377	83	46%	41%	11%	2%	43%	57%	0%	0%
Electronics	420	780	43	44%	37%	14%	5%	43%	53%	0%	5%
Automobile Assembly	507	1,058	47	53%	47%	7%	6%	41%	47%	0%	0%
Shipbuilding and Repair	22	51	4	54%	0%	11%	50%	35%	50%	0%	0%
Ground Transportation	1,585	2,499	103	64%	46%	11%	10%	26%	44%	0%	1%
Water Transportation	84	141	11	38%	9%	24%	36%	38%	45%	0%	9%
Air Transportation	96	151	12	28%	33%	15%	42%	57%	25%	0%	0%
Fossil Fuel Electric Power	1,318	2,430	135	59%	73%	32%	21%	9%	5%	0%	0%
Dry Cleaning	1,234	1,436	16	69%	56%	1%	6%	30%	38%	0%	0%

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